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 EXAMINER

SHOSHO, C

 ART UNIT PAPER NUMBER

1714

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

| | | |
|------------------------------|--------------------------------------|---|
| Office Action Summary | Application No. 09/047,717 | Applicant(s) Taniguchi et al. |
| | Examiner Callie Shosho | Group Art Unit 1714 |

- Responsive to communication(s) filed on _____.
- This action is **FINAL**.
- Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- Claim(s) 1-21 is/are pending in the application.
- Of the above, claim(s) _____ is/are withdrawn from consideration.
- Claim(s) _____ is/are allowed.
- Claim(s) 1-21 is/are rejected.
- Claim(s) _____ is/are objected to.
- Claims _____ are subject to restriction or election requirement.

Application Papers

- See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- The drawing(s) filed on _____ is/are objected to by the Examiner.
- The proposed drawing correction, filed on _____ is approved disapproved.
- The specification is objected to by the Examiner.
- The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- All Some* None of the CERTIFIED copies of the priority documents have been received.
- received in Application No. (Series Code/Serial Number) _____.
- received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- *Certified copies not received: _____.
- Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- Notice of References Cited, PTO-892
- Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- Interview Summary, PTO-413
- Notice of Draftsperson's Patent Drawing Review, PTO-948
- Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Claim Objections

1. Claims 4-13 and 16-20 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only and cannot depend from any other multiple dependent claim. See MPEP § 608.01(n).

Claims 4-13 and 16-20 are in improper form because they depend on other multiple dependent claims.

Claim Rejections - 35 USC § 112

2. Claim 12 contains the trademark/trade name C.I. Direct Black, C.I. Food Black, C.I. Acid Yellow, C.I. Direct Yellow, C.I. Acid Red, C.I. Direct Red, C.I. Acid Blue, and C.I. Direct Blue. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods

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associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe dyes and, accordingly, the identification/description is indefinite.

Claim Rejections - 35 USC § 103

3. In accordance with MPEP § 608.01(n), due to the presence of improper multiple dependent claims, claims 4-13 and 16-20 should not be further treated on the merits (see paragraph 1). However, in the interest of "compact prosecution", claims 4-13 and 16-20 have been treated as if they were corrected to be in proper multiple dependent form, and the following 103 rejection is given.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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5. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stoffel et al. (U.S. 5,555,008) in view of Tomita et al. (U.S. 5,019,164), Nagasawa et al. (U.S. 5,861,447), Breton et al. (U.S. 5,833,744), Schwarz, Jr. (U.S. 5,223,026), Marritt (U.S. 5,871,572), Sano et al. (U.S. 5,769,930), Yamashita et al. (U.S. 5,370,731), Yui et al. (U.S. 5,622,549), and Shimomura et al. (U.S. 5,866,638).

Stoffel et al. disclose an ink set (col.20, line 54) having reduced bleed which comprises at least one anionic ink and at least one cationic ink (col.3, lines 1-15). The anionic ink comprises an aqueous carrier medium of water and 5-70% water-soluble organic solvent which has a lower vapor pressure than water such as polyhydric alcohols (col.4, lines 45-61), a colorant such as pigments or acid and/or direct dyes (col.5, lines 5 and 54-64), and an anionic polymer which can be an acid addition salt (col.7, lines 25-37). The cationic ink has an aqueous carrier medium and colorant identical to the anionic ink as well as a cationic polymer (col.6, lines 50-67). If there are more than two inks such as black, yellow, magenta, and cyan (col.3, lines 28-36), the most important ink is made of one charge characteristic (i.e. anionic or cationic), while the other inks are of the other charge characteristic (col.8, lines 45-48). Therefore, the ink set may comprise a black ink which is anionic, and cyan, yellow, and magenta inks which are cationic or vice versa (col.16, lines 25-40, col.17, line 65-col.18, line 35), which is identical to present claims 13-15. A method is disclosed where the ink is printed with an ink jet printer onto a recording material to produce a printed image (col.8, line 65-col.9, line 8 and col.15, lines 44-48).

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The difference between Stoffel et al. and the present claimed invention is the requirement in the claims of (a) specific type of cationic polymer, (b) base such as alkali metal or alkaline earth metal hydroxide, (c) water soluble resin, and (d) specific types of dyes.

With respect to difference (a), Tomita et al. and Nagasawa et al. both disclose ink compositions which contain a cationic polymer. Tomita et al. disclose a polyallylamine identical to the presently claimed cationic water soluble resin (see present claims 1-2 and 6-7) when R¹ = H or CH₃ and R² = CH₃ and which has a molecular weight of greater than 300 (col.2, lines 30 and 50-65). Nagasawa et al. disclose a cationic polymer with a weight or number average molecular weight of less than 50,000, preferably 1,000-20,000 (col.7, lines 30-36). The cationic polymer is a polyallylamine such as polyallylamine hydrochloride (PAA-HCl) (col.7, lines 46-55 and col.8, lines 60-62). The motivation for using the cationic polymers is to impart improved water resistance to the ink compositions (Tomita et al., col.2, lines 23-35 and Nagasawa et al., col.6, lines 65-67).

In light of the motivation for using specific cationic polymers disclosed by Tomita et al. and Nagasawa et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use these specific cationic polymers as the cationic polymer in the ink set of Stoffel et al. in order to produce an ink set that has improved water resistance, and thereby arrive at the claimed invention.

With respect to difference (b), Breton et al. and Schwarz, Jr., which are both drawn to ink jet ink compositions, disclose the use of bases such as alkali salt hydroxides and alkaline earth

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metal hydroxides respectively (Breton et al., col.10, line 66-col.11, line 4 and Schwarz, Jr, col.13, lines 11-15). The motivation for using these bases is to control the pH of the ink and to allow the ink to dry quickly so that no smudging or smearing occurs.

In light of the motivation for using alkali salt hydroxides and alkaline earth metal hydroxides disclosed by Breton et al. and Schwarz Jr. as described above, it therefore would have been obvious to one of ordinary skill in the art to use alkali salt hydroxides and alkaline earth metal hydroxides in the ink set of Stoffel et al. in order to produce an ink set that has suitable pH and will dry quickly so that no smudging or smearing occurs, and thereby arrive at the claimed invention.

With respect to difference (c), Nagasawa et al. discloses that a water soluble resin can be used in addition to the cationic resin (col. 11, lines 39-41). The motivation for using the water soluble resin is as a binder to help bind and adhere the colorants to the substrate.

In light of the motivation for using a water soluble resin disclosed by Nagasawa et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use a water soluble resin in the ink set of Stoffel et al. in order to produce an ink set where the colorants are adhered to the substrate, and thereby arrive at the claimed invention.

With respect to difference (d), Stoffel et al. generically discloses the use of acid and/or direct dyes. Sano et al., Marritt, Yamashita et al., Yui et al, Shimomura et al., all of which are drawn to ink jet ink compositions, disclose that the inks can contain colorants such as C.I. Direct Black 19, 154, 168, C.I. Direct Yellow 50, 86, 132, 142, 144, C.I. Direct Blue 86, 87, 199, C.I.

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Direct Red 9, 227, C.I. Acid Yellow 23, C.I. Acid Blue 249, C.I. Acid Red 52, 249, 289, Microjet Cw-1, an anionic pigment which contains functional groups on its surface, Food Black 2, C.I. Acid Blue 249, C.I. Direct Black 171 and C.I. Direct Black 195 (Sano et al. 2, line 52-3, line 12, Marritt, col.7, lines 45-64, Yamashita et al., col.2, line 66 and col.3, line 13, Yui et al., col.3, lines 48-49). Shimomura et al. disclose the use of a magenta colorant (col.22, line 15) identical to the one presently claimed (see present claim 12, structure II). The motivation for using the different types of dyes is that they provide for inks in many different colors.

In light of the motivation for using specific types of dyes disclosed by Sano et al., Marritt, Yamashita et al., Yui et al, and Shimomura et al. as disclosed above and given Stoffel et al.'s generic disclosure of dyes, it therefore would have been obvious to one of ordinary skill in the art to use these specific types of dyes in the ink set of Stoffel et al. in order to produce an ink set that is available in many different colors, and thereby arrive at the claimed invention.

6. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al. (U.S. 5,019,164) or Nagasawa et al. (U.S. 5,861,447) in view of Stoffel et al. (U.S. 5,555,008), Breton et al. (U.S. 5,833,744), Schwarz, Jr. (U.S. 5,223,026), Marritt (U.S. 5,871,572), Sano et al. (U.S. 5,769,930), Yamashita et al. (U.S. 5,370,731), Yui et al. (U.S. 5,622,549), and Shimomura et al. (U.S. 5,866,638).

Tomita et al. discloses an ink composition which contains (1) water (col.2, line 61); (2) 5-30% water soluble organic solvent which has a vapor pressure lower than water such as ethylene

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glycol (col.3, line 32), (3) a water soluble resin such as polyvinyl pyrrolidone (col.3, line 30-31), (4) dye (col.2, line 62), (5) pH adjustor such as sodium hydroxide (col.6, line 19 and col.9, line 67), and (5) polyallylamines (col.2, line 30 and 50-65) which are identical to the presently claimed cationic water soluble resin (see present claims 1,6,7) when R¹ = H or CH₃ and R² = CH₃ and have a molecular weight greater than 300.

Nagasawa et al. disclose an ink composition which contains (1) water (col.14, line 23), (2) 3-50% water soluble organic solvent which has a vapor pressure lower than water such as ethylene glycol (col.13, lines 28-45), (3) a water soluble resin (col.11, lines 39-41), (4) pigment or dye (col.11, line 43), and (5) a cationic polymer with a weight or number average molecular weight of less than 50,000, preferably 1,000-20,000 (col.7, lines 30-36). The cationic polymer is polyallylamine such as polyallylamine-hydrochloride (col.7, lines 46-55 and col.8, lines 60-62). The ink is printed by an ink jet printer onto paper producing a recorded image (col.15, lines 9-12).

The difference between Tomita et al. or Nagasawa et al. and the present claimed invention is the requirement in the claims of (a) base such as alkali metal or alkaline earth metal hydroxide and (b) an ink set containing black, yellow, cyan, and magenta inks (see present claims 12-19).

With respect to difference (a), Breton et al. and Schwarz, Jr., which are both drawn to ink jet ink compositions, disclose the use bases such as alkali salt hydroxides and alkaline earth metal hydroxides respectively (Breton et al., col.10, line 66-col.11, line 4 and Schwarz, Jr col.13,

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lines 11-15). The motivation for using these bases is to control the pH of the ink and to allow the ink to dry quickly so that no smudging or smearing occurs.

In light of the motivation for using alkali salt hydroxides and alkaline earth metal hydroxides disclosed by Breton et al. and Schwarz Jr. as described above, it therefore would have been obvious to one of ordinary skill in the art to use alkali salt hydroxides and alkaline earth metal hydroxides in the ink composition of Tomita et al. or Nagasawa et al. in order to produce an ink set that has suitable pH and will dry quickly so that no smudging and smearing occurs, and thereby arrive at the claimed invention.

With respect to difference (b), Stoffel et al. disclose an ink set (col.20, line 54) having reduced bleed which comprises at least one anionic ink and at least one cationic ink (col.1, lines 1-15). The anionic ink comprises an aqueous carrier medium of water and 5-70% water-soluble organic solvent which has a lower vapor pressure than water such as polyhydric alcohols (col.4, lines 45-61), a colorant such as pigments or acid and/or direct dyes (col.5, lines 5 and 54-64), and an anionic polymer which can be an acid addition salt (col.7, lines 25-37). The cationic ink has an aqueous carrier medium and colorant identical to the anionic ink as well as a cationic polymer (col.6, lines 50-67). If there are more than two inks such as black, yellow, magenta, and cyan (col.3, lines 28-36), the most important ink is made of one charge characteristic (i.e. anionic or cationic), while the other inks are of the other charge characteristic (col.8, lines 45-48). Therefore, the ink set may comprise a black ink which is anionic, and cyan, yellow, and magenta inks which are cationic or vice versa (see col.16, lines 25-40 and col.17, line 65-col.18, line 35),

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which is identical to present claims 13-15. A method is disclosed where the ink is printed with an ink jet printer onto a recording material to produce a printed image (col.8, line 65-col.9, line 8 and col.15, lines 44-48). The motivation for using an ink set it to be able to produce and print many different colors at the same time which has reduced color bleed.

Stoffel et al. generically discloses the use of acid and/or direct dyes. Sano et al., Marritt, Yamashita et al., Yui et al, Shimomura et al., all of which are drawn to ink jet ink compositions, disclose that the inks can contain colorants such as C.I. Direct Black 19, 154, 168, C.I. Direct Yellow 50, 86, 132, 142, 144, C.I. Direct Blue 86, 87, 199, C.I. Direct Red 9, 227, C.I. Acid Yellow 23, C.I. Acid Blue 249, C.I. Acid Red 52, 249, 289, Microjet Cw-1, an anionic pigment which contains functional groups on its surface, Food Black 2, C.I. Acid Blue 249, C.I. Direct Black 171 and C.I. Direct Black 195 (Sano et al. 2, line 52-3, line 12, Marritt, col.7, lines 45-64, Yamashita et al., col.2, line 66 and col.3, line 13, Yui et al., col.3, lines 48-49). Shimomura et al. disclose the use of a magenta colorant (col.22, line 15) identical to the one presently claimed (see present claim 12, structure II).The motivation for using the different types of dyes is that they provide for inks in many different colors.

In light of the motivation for using an ink set and specific types of dyes disclosed by Stoffel et al., Sano et al., Marritt, Yamashita et al., Yui et al, and Shimomura et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use an ink set containing the ink composition of Tomita et al. or Nagasawa et al. in order to produce and print

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inks that are available in many colors and has reduced color bleed, and thereby arrive at the claimed invention.

7. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. (U.S. 5,624,484) in view of Tomita et al. (U.S. 5,019,164), Nagasawa et al. (U.S. 5,861,447), Schwarz, Jr. (U.S. 5,223,026), Marritt (U.S. 5,871,572), Sano et al. (U.S. 5,769,930), Yamashita et al. (U.S. 5,370,731), Yui et al. (U.S. 5,622,549), and Shimomura et al. (U.S. 5,866,638).

Takahashi et al. disclose an ink set which comprises a liquid composition and black, magenta, cyan, and yellow inks (col.2, lines 60-64 and col.3, lines 1-4). The liquid composition contains a cationic substance such as polyallylamine which has a molecular weight of 100-10,000 and solvent (col.7, lines 35-44). The ink compositions contain colorants such as pigments or acid and/or direct dyes, water, 5-60% water soluble solvent which has a vapor pressure lower than water, water soluble resin such as polyvinyl pyrrolidone, and pH adjustors such as hydroxides of alkali metals (col.8, lines 9-24 and 32-47, col.9, line 48, and col.9, line 65-col.10, line 2). If a pigment is used as the colorant, an anionic polymer may also be included in the ink composition (col.11, lines 30-34). Takahashi et al. discloses a liquid composition which contains a cationic resin that interacts with inks containing anionic compounds. There is an ionic interaction between the anionic compound of the ink and the cationic substance which causes the anionic compound to separate from the liquid phase to form an aggregate with the cationic substance. It is difficult for aggregates of this size to penetrate the paper, so that only the liquid component,

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separated from the solid component, penetrates into the recording paper. This mechanism produces inks which have reduced bleed as well as improved waterfastness and light fastness (col.3, line 62-col.4, line 33). The present claims, however, disclose ink compositions which themselves contain the cationic substance (i.e there is no separate liquid composition as disclosed by Takahashi et al.). However, it would have been obvious to one of ordinary skill in the art that it is equivalent and interchangeable to either produce ink compositions which contain the cationic substance (as in the present claims) or to produce a liquid composition which contains the cationic substance and then interacts with an ink composition (as in Takahashi et al.), since the end result will be the same - an interaction occurs between the cationic substance and the anionic compound resulting in an ink which has have reduced bleed as well as improved waterfastness and light fastness.

The difference between Takahashi et al. and the present claimed invention is the requirement in the claims of (a) specific type of cationic resin, (b) base such as alkaline earth metal hydroxide, and (c) specific types of dyes.

With respect to difference (a), Takahashi et al. generically disclose polyallylamine as the cationic resin. Tomita et al. and Nagasawa et al. both disclose ink compositions which contain a cationic polymer. Tomita et al. disclose a polyallylamine identical to the presently claimed cationic water soluble resin (see present claims 1-2 and 6-7) when $R^1 = H$ or CH_3 and $R^2 = CH_3$, which has a molecular weight of greater than 300 (col.2, lines 30 and 50-65). Nagasawa et al. disclose a cationic polymer with a weight or number average molecular weight of less than

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50,000, preferably 1,000-20,000 (col.7, lines 30-36). The cationic polymer is a polyallylamine such as polyallylamine hydrochloride (PAA-HCl) (col.7, lines 46-55 and col.8, lines 60-62). The motivation for using the cationic polymers is to impart improved water resistance to the ink compositions (Tomita et al., col.2, lines 23-35 and Nagasawa et al., col.6, lines 65-67).

In light of the motivation for using specific cationic polymers disclosed by Tomita et al. and Nagasawa et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use these specific cationic polymers as the cationic polymer in the ink set of Takahashi et al. in order to produce an ink set that has improved water resistance, and thereby arrive at the claimed invention.

With respect to difference (b), Schwarz, Jr., which is drawn to ink jet ink compositions, disclose the use bases such as alkaline earth metal hydroxides (col.13, lines 11-15). The motivation for using these bases is to control the pH of the ink and to allow the ink to dry quickly so that no smudging or smearing occurs.

In light of the motivation for using alkaline earth metal hydroxides disclosed by Schwarz, Jr. as described above, it therefore would have been obvious to one of ordinary skill in the art to use alkaline earth metal hydroxides in the ink set of Takahashi et al. in order to produce an ink set will dry quickly, and thereby arrive at the claimed invention.

With respect to difference (c), Takahashi et al. generically discloses the use of acid and/or direct dyes. Sano et al., Marritt, Yamashita et al., Yui et al, Shimomura et al., all of which are drawn to ink jet ink compositions, disclose that the inks can contain colorants such as C.I. Direct

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Black 19, 154, 168, C.I. Direct Yellow 50, 86, 132, 142, 144, C.I. Direct Blue 86, 87, 199, C.I. Direct Red 9, 227, C.I. Acid Yellow 23, C.I. Acid Blue 249, C.I. Acid Red 52, 249, 289, Microjet Cw-1, an anionic pigment which contains functional groups on its surface, Food Black 2, C.I. Acid Blue 249, C.I. Direct Black 171 and C.I. Direct Black 195 (Sano et al. 2, line 52-3, line 12, Marritt, col.7, lines 45-64, Yamashita et al., col.2, line 66 and col.3, line 13, Yui et al., col.3, lines 48-49). Shimomura et al. disclose the use of a magenta colorant (col.22, line 15) identical to the one presently claimed (see present claim 12, structure II). The motivation for using the different types of dyes is that they provide for inks in many different colors.

In light of the motivation for using specific types of dyes disclosed by Sano et al., Marritt, Yamashita et al., Yui et al., and Shimomura et al. as disclosed above and given Takahashi et al.'s generic disclosure of dyes, it therefore would have been obvious to one of ordinary skill in the art to use these specific types of dyes in the ink set of Takahashi et al. in order to produce an ink set that is available in many different colors, and thereby arrive at the claimed invention.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following prior art disclose ink sets which comprise liquid compositions which contain cationic substances and ink compositions:

Yatake (U.S. 5,746,818)

Kubota et al. (U.S. 5,846,306)

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Kurabayshi et al. (U.S. 5,618,338)

Sato et al. (U.S. 5,835,116)

The following prior art discloses polyallylamines:

Miyamoto et al. (U.S. 4,613,525)

Keim (U.S. 3,686,151)

Tsuchii et al. (U.S. 5,805,190)

Kondo et al. (U.S. 5,320,897)

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie Shosho whose telephone number is (703) 305-0208. The examiner can normally be reached on Mondays-Thursdays from 7:00 am to 4:30 pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan, can be reached on (703) 306-2777. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

CJ

Callie Shosho

2/26/99

Vam Jagannathan
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